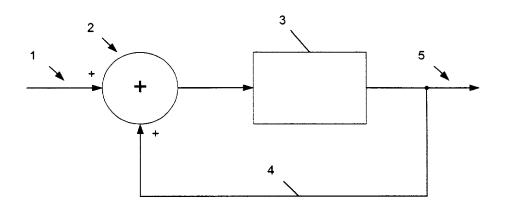
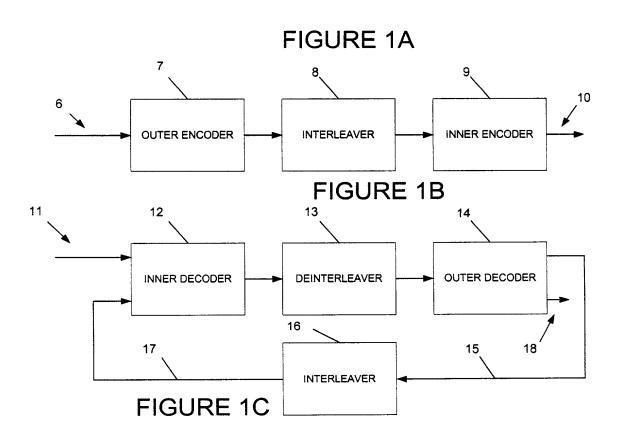
RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER Inventors: Donald B. Eidson, et al. Howrey Dkt. No. 01827.0037.CPUS01 1/24



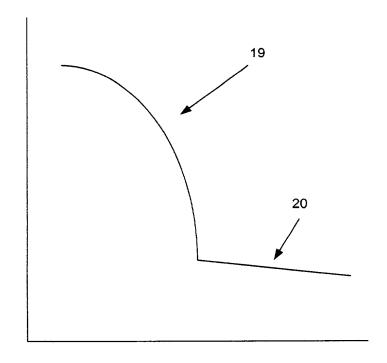


RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER

Inventors: Donald B. Eidson, et al. Howrey Dkt. No. 01827.0037.CPUS01

2/24





 E_b/N_0

FIGURE 2

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER

Inventors: Donald B. Eidson, et al. Howrey Dkt. No. 01827.0037.CPUS01

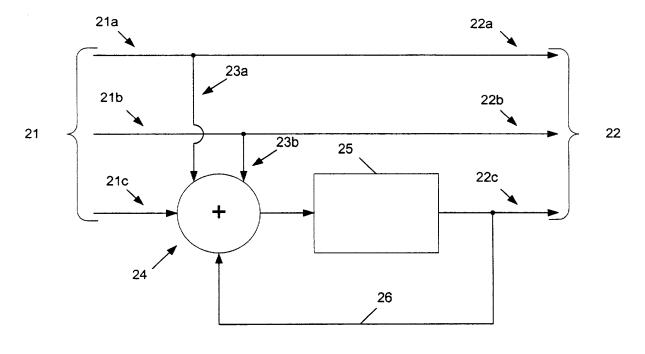


FIGURE 3A

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER Inventors: Donald B. Eidson, et al.

Howrey Dkt. No. 01827.0037.CPUS01 4/24

27a 30a 27b 30b

29a 27b 29b 30c 30c 31 32

FIGURE 3B

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER Inventors: Donald B. Eidenn et al.

Inventors: Donald B. Eidson, et al. Howrey Dkt. No. 01827.0037.CPUS01

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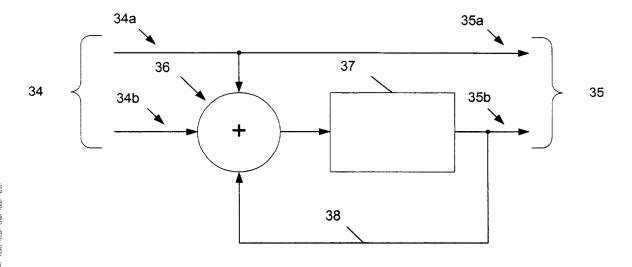
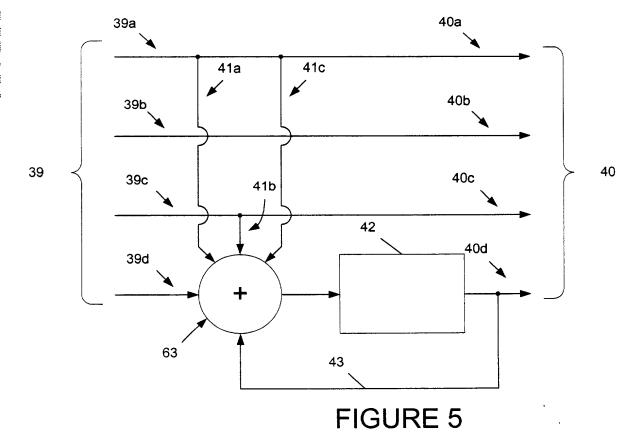


FIGURE 4



RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER Inventors: Donald B. Eidson, et al.

Howrey Dkt. No. 01827.0037.CPUS01

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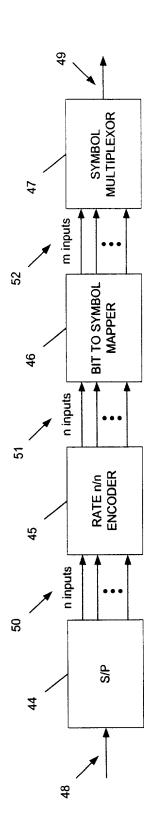


FIGURE (

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER Inventors: Donald B. Eidson, et al. Howrey Dkt. No. 01827.0037.CPUS01 7/24

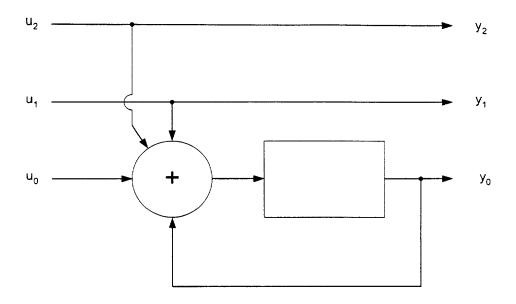
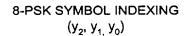


FIGURE 7A



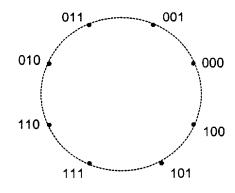
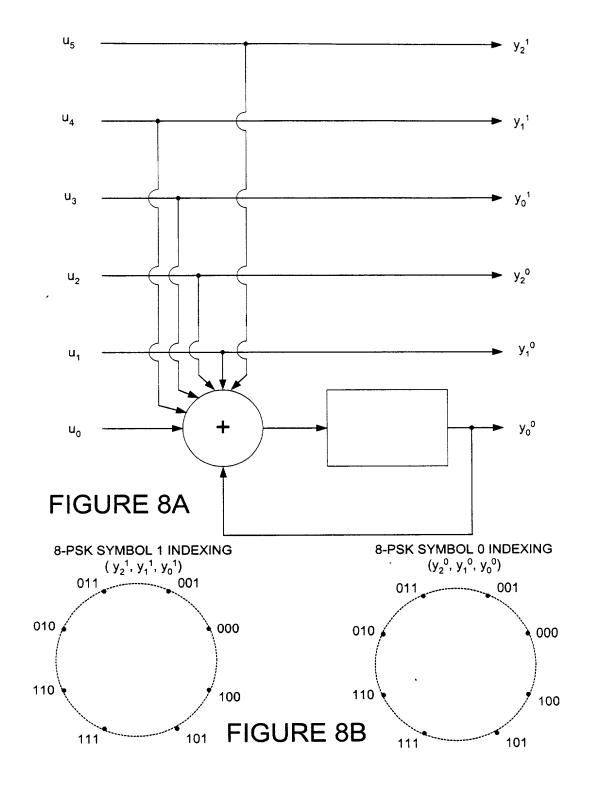


FIGURE 7B

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER Inventors: Donald B. Eidson, et al.

Howrey Dkt. No. 01827.0037.CPUS01 8/24



RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER

Inventors: Donald B. Eidson, et al. Howrey Dkt. No. 01827.0037.CPUS01 9/24

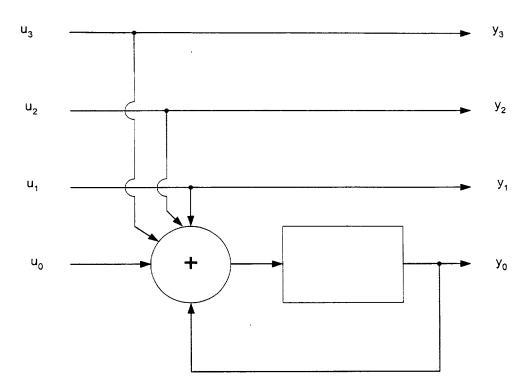


FIGURE 9A

16-QAM symbol indexing (y_3, y_2, y_1, y_0)

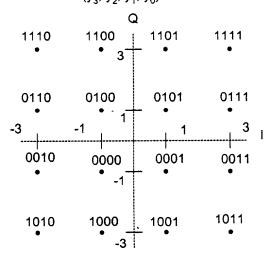


FIGURE 9B

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER Inventors: Donald B. Eidson, et al. Howrey Dkt. No. 01827.0037.CPUS01 10/24

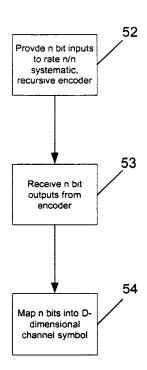
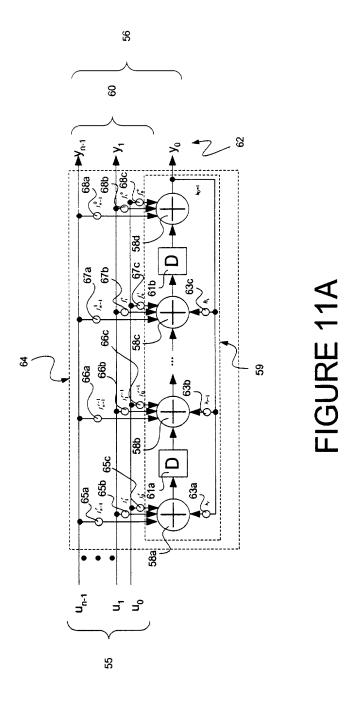


FIGURE 10

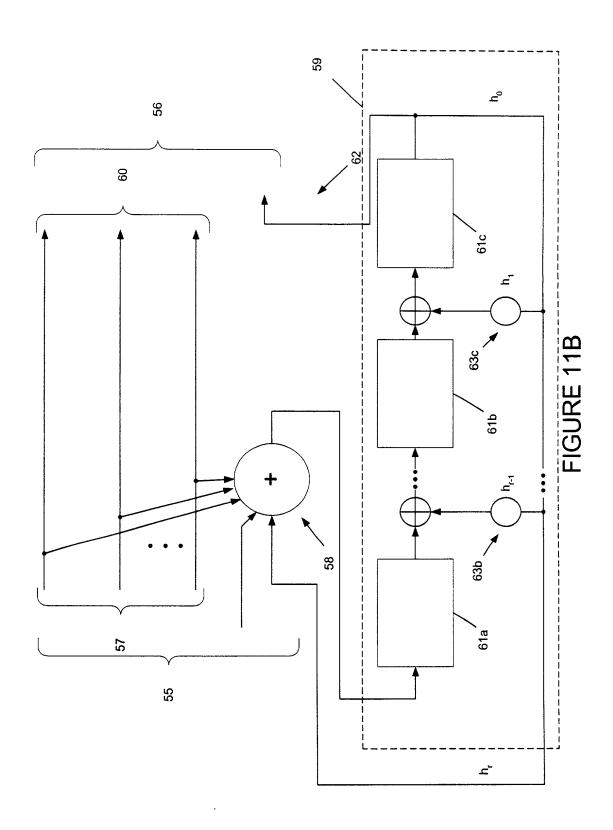
RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER Inventors: Donald B. Eidson, et al.

Howrey Dkt. No. 01827.0037.CPUS01

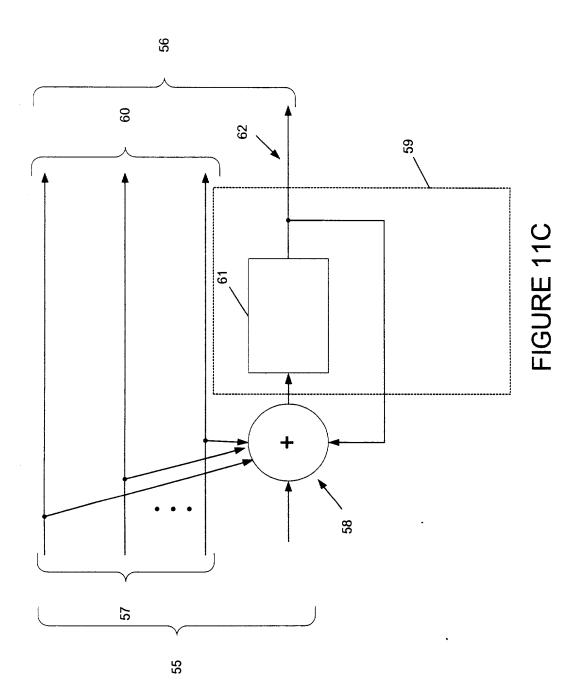


RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER

Inventors: Donald B. Eidson, et al. Howrey Dkt. No. 01827.0037.CPUS01

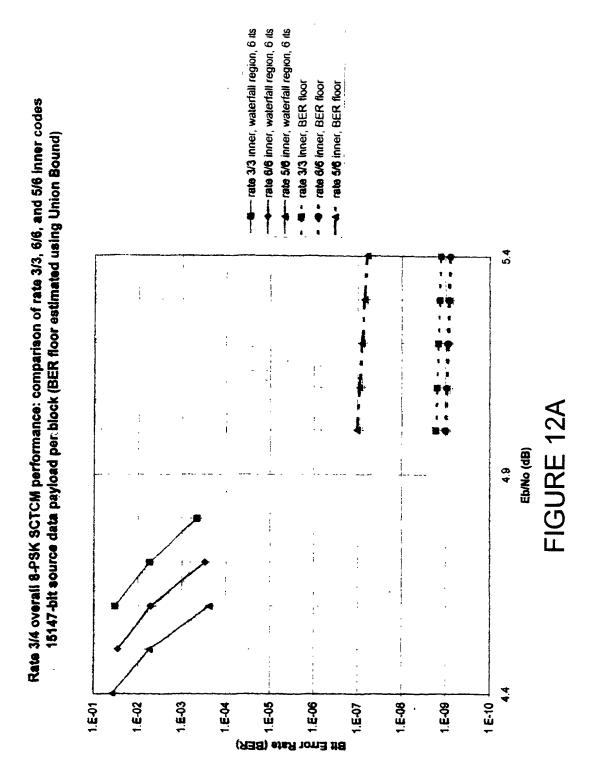


RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER Inventors: Donald B. Eidson, et al. Howrey Dkt. No. 01827.0037.CPUS01



RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER

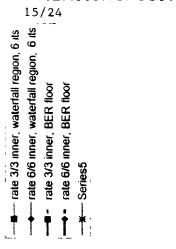
Inventors: Donald B. Eidson, et al. Howrey Dkt. No. 01827.0037.CPUS01



Rate 5/6 overall 8-PSK SCTCM performance: rate 3/3 inner code vs rate 6/6 inner code 15125-bit source data payload per block (BER floor estimated using Union Bound)

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER

Inventors: Donald B. Eidson, et al. Howrey Dkt. No. 01827.0037.CPUS01



7.9 7.4 69 Eb/No (dB) 6.4 59 5.4 1.E-08 1.E-09 1.E-01 1 E-02 1.E-03 1.E-05 1 E-06 1.E-07 1.E-04 Bit Error Rate (BER)

FIGURE 12B

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER Inventors: Donald B. Eidson, et al. Inventors: Donald B. Eidson, et al. Howrey Dkt. No. 01827.0037.CPUS01 1st of 6 finer, waterfall region, 6 lts. 1st of 724 1st of 6 finer, waterfall region 6 lts. 1st of 6 finer, ber floor 1st of 6 finer, ber floor 1st of 6 finer, waterfall region 6 lts. 1st of 724 1st of 72 -#- rate 3/3 inner, BER floor Rate 8/9 overall 8-PSK SCTCM performance: rate 3/3 inner code vs rate 6/6 inner code 15128-bit source data payload per block (BER floor estimated using Union Bound) 7.8 FIGURE 12C Eb/No (dB) 68

1.E-07

1.E-08

1.E-03

1.E-01

1 E-02

6.3

1.E-09

1.E-02

1 E-01

1.E-03

1.E-04

1.E-05

1.E-06

Sit Error Rate (BER)

1.E-07

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER Inventors: Donald B. Eidson, et al. Inventors: Donald B. Eidson, et al. Howrey Materfall region, 6 list. 12/2 inner, waterfall region, 6 list. 12/2 inner, BER floor 12/2 inner, BER floor 12/2 inner, BER floor 13/2 inner, BER floor 14/4 inner, BER floor 15/2 inner, BER floor 16/2 inner, BER floor 17/2 inner, BER floor 17/2 inner, BER floor 17/2 inner, BER floor 18/2 Rate 4/5 overall QPSK SCCC performance: rate 2/2 inner code vs rate 4/4 inner code 16384-bit source data payload per block (BER floor estimated using Union Bound) FIGURE 121 Eb/No (dB) 33

1.E-10

1.E-09

1.E-08

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER Inventors: Donald B. Eidson, et al. Howrey Dkt. No. 01827.0037.CPUS01 18/24 - JPL's "best of rate 5/6 m=1 inner *- rate 3/3 m=1 inner, rate 2/3 outer ±- rate 6/6 m=1 inner, rate 2/3 outer - Baseline rate 5/6 inner Rate 2/3 Overall, 15144 source bits, 5 iterations Simulated (Waterfall) Performance **FIGURE 13A** Rate 2/3 Overall Waterfall Comparisons Eb/No (dB) 3.8 3.7 1.E-02 1.E-83 1.E-01 2

The first first was been been found to the first first

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER Inventors: Donald B. Eidson, et al. Howrey Dkt. No. 01827.0037.CPUS01 19/24 Baseline rate 3/3 inner - JPL rate 3/3 inner Rate 5/6 Overall (15147 source bits per block, 6 iterations) Simulated (Waterfall) Performance FIGURE 13B Rate 5/6 Overall Waterfall Comparisons 1.E-01 1.E-02 1.E-03 (REGO MAR JOINE (BER)

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER Inventors: Donald B. Eidson, et al.

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER Inventors: Donald B. Fidson, et al.

Inventors: Donald B. Eidson, et al. Howrey Dkt. No. 01827.0037.CPUS01

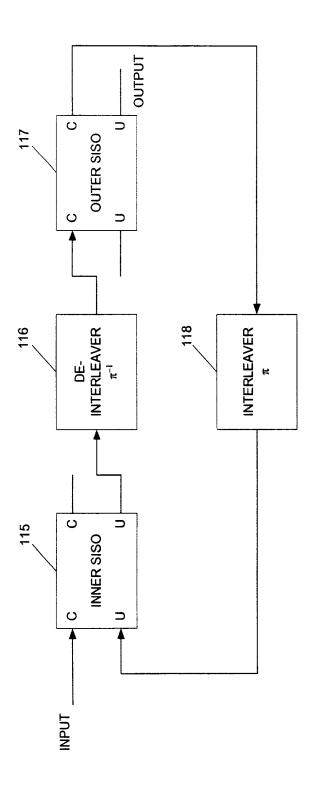
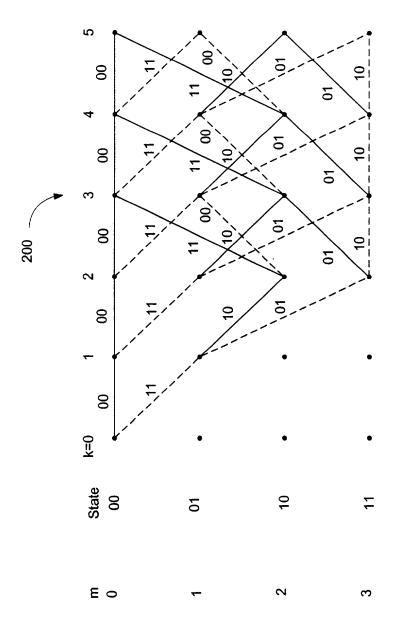


FIGURE 14

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER

Inventors: Donald B. Eidson, et al. Howrey Dkt. No. 01827.0037.CPUS01



RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER

Inventors: Donald B. Eidson, et al. Howrey Dkt. No. 01827.0037.CPUS01 23/24

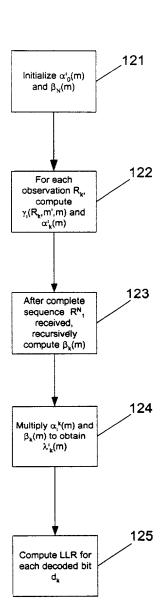


FIGURE 16

RATE N/N SYSTEMATIC, RECURSIVE CONVOLUTIONAL ENCODER AND CORRESPONDING DECODER

Inventors: Donald B. Eidson, et al. Howrey Dkt. No. 01827.0037.CPUS01

